REMARKS

This amendment is responsive to the office action dated December 30, 2002.

Claims 1-14 are pending.

Claims 6-9 and 14 have been allowed

Claims 2, 3, 5, and 12 are objected to as being dependent on rejected claims.

Claims 1, 4, 10, 11, and 13 were rejected.

The independent claims 1 and 10 (and thus also dependent claims 4, 11 and 13) have been amended to specify that the digital watermark carries steganographic data. A minor typographical change has been made to claim 14. Reconsideration and allowance of rejected claims 1, 4, 10, 11, and 13 is respectfully requested for the reasons explained below.

It is noted that a telephone interview was held with the examiner on 20 December 2002. During this interview, the examiner called a new reference (patent 5,880,760) to the attention of the applicant. Applicant's attorney reviewed this new reference and returned the examiner's call. Applicant's attorney explained that this new reference related to "conventional watermarks" rather to that what is known in the art as "digital watermarks". A conventional watermark can be in a digital form; however, the term "digital watermark" is used in the art (and explained in the applicant's specifications) to mean a watermark that "modifies an image" so that the image steganographically or cryptographically carries what is called "payload data" without materially changing the visual appearance of the image. No specific modification of the claims to make them allowable was discussed.

Claims 1, 10 and 11 were rejected as un-patentable under 35 U.S.C. 103(a) over Stenzel (patent 4,591,707) in view Desie (Patent 5,880,760). Claims 4 and 13 were rejected under 35 U.S.C. 103(a) as un-patentable over Stenzel in view of Desie and Daigneault (Patent 6,334,678).

It is very important to note that the term "watermark" can be used to mean two entirely different types of things. What can be called "conventional watermarks" have been

widely used for many years. Conventional watermarks can generally be seen by holding a paper in front of a light source or by looking at the paper at an angle rather than directly. A conventional watermark is sometimes merely a very light image that is printed behind the main text on a document. For example, the word "confidential" might be printed in large, very light letters to form the background of a document containing normal text. A conventional watermark can be either formed by modifying the fibers of a substrate such as paper or by apply ink or other material on top of the substrate. The origin of the term comes from the fact that the fibers of paper can be slightly modified by applying water to the paper or by changing how the water is removed when paper is manufactured. Conventional watermarks can be either formed as continuous marks or they can be formed by a series of dots, that is by digital markings.

A second and newer type of watermark is generally referred to as a "digital watermark". The term "digital watermarking" refers to steganographic or cryptographic techniques that "hide" data in images or audio files. In the technical literature, the term "digital watermark" is used to define these new steganographic or cryptographic techniques. It is noted that a "conventional watermark" can be formed digitally, hence, to understand what is meant by the term "watermark", the term must be considered in the context in which it is used. There is wide spread use of the new "digital watermarking" techniques which can "hide" data in images or audio files. For example, the popular image editing program "Adobe Photoshop" has a tool for slightly modifying the bits in an image so that what is termed "payload data" can be hidden in an image without changing the visual appearance of the image. There are dozens of patents related to how one can generate and read digital watermarks. Using a digital watermark one can modify a digital image or an audio file to "hide" data in the image or audio file without materially changing the visual appearance of the image or the sound of the audio file. The hidden data can be read by analyzing the image or the sound file with a special computer program. Digital watermarks are often used to "copy protect images". Digital watermarks can be either designed so that they will remain in the image even if the image is enlarged, clipped, rotated, etc.

The key difference between digital watermarks and "conventional watermarks" is that a conventional watermark is a separate mark that is visible under certain conditions. The new steganographic technique called "digital watermarking" modifies the bits in an image or sound file and the "payload data" is carried by the image or sound file itself.

The present invention is directed a technique for embedding a digital watermark (that is, a watermark that caries steganographic data) in an image. Claims 1, 10 and 11 are specifically directed inserting a digital watermarking (that is, a watermark that carries steganographic data) into an image. As amended claim 1 specifically calls for "A method of steganographically watermarking an image" and claims 10 and 11 include the phrase "whereby any image printed on said substrate will bear a digital watermark which carries steganographic data".

These claims are directed to a technique of " digitally watermarking an image" so that the image carries steganographic data. The word "steganographic" has been added to the claim to make this explicitly clear. As explained in the applicant's specification (see page 1), when an image is digitally watermarked, the changes are not visible to a normal observer and action such as rotating , enlarging, etc, should not prevent the image from being read. Applicant's specifications gives the example of using the invention to digitally watermark the images projected on a movie screen. In this way if one photographs those images, the photographed images will carry the digitally watermark and one will be able to determine the source of the images.

The point is that the rejected claims call for digitally watermarking an image so that it carries steganographic data. As is well known in the literature, once an image is digitally watermarked, copies of the image will bear the watermark and the source of the image can be determined. Thus, as explained in the specification if, for example, the invention is used to watermark the screen of a movie theater, any images copied from the screen will be watermarked. It is noted that applicant's claims are not limited to using the invention to watermark images projected on a screen of a theater. This is

merely an example to show what is meant by "watermarking an image" as is specified in applicant's claims.

The cited Stenzel reference, relates to placing a "hallmark" on a document. A "hallmark" is similar to a "conventional watermark" that is described above. The "hallmark" described in the Stenzel reference is essentially invisible to the human eye; however, it can be detected by automatic equipment. Stenzel explains that an image can be printed over the hallmark.

While an image can be printed over the hallmark described by Stenzel, this reference does not teach "watermarking an image" as claimed by the applicant. If the printed image of Stenzel is copied it will not contain the "hallmark". The applicant's invention is designed to "digitally watermark the image". If an image, digitally watermarked by the applicant's technique, is copied, the copy will bear the digital watermark. A noted by the examiner, the Stenzel reference specifically selects material so that the conventional watermark is transparent. This clearly shows that Stenzel does not teach how to "digitally watermark and image" as claimed by the applicant. If an image printed as described in the Stenzel reference is copied, it will not contain the watermark. That is, the image itself is not watermarked. This is directly contrary to the very purpose of the applicant's invention. The applicant's invention watermarks an image so that the image carries steganographic data. As explained in the applicant's specifications, if a watermarked image is copied, the watermark in the copy will identify the origin of the image.

The Desie reference is directed to printing information on a substrate that has a security feature such as a conventional watermark. This patent is directed to a printing technique whereby the special features on the substrate **do not** affect the subsequent printing operation. Desie is specifically trying to avoid having the underlying features affect the printing that is done on the top of these features. This is specifically contrary to the applicant's teaching.

Since the cited reference alone or together do not teach or suggest the applicant's novel combination, allowance of claims 1, 10 and 11 is respectfully requested.

The rejection of claims 4 and 13 is based on Stenzel and Desie along with the Daigneault reference. The above remarks relative to Stenzel and Desie also apply to this rejection. The Daigneault reference relates to printing a conventional watermark on paper. The examiner refers to col 2 lines 15-21 of Daigneault. The description at this point in Daigneault relates to printing a "conventional watermark". There is no suggestion that an image printed over this conventional watermark would in fact be watermarked as thought and claimed by the applicant.

In summary, application teaches and claims a technique for "digitally watermarking an image" so that the image carries steganographic data. As is well known, when a digitally watermarked image is copied, the digital watermark can be read to trace the origin of the image. The cited references related to "conventional watermarks". These reference do not teach or suggest that images printed or projected over these "conventional watermarks" will be watermarked. Stated differently, the references do not teach how to digitally watermark an image so that the image carries steganographic data.

For the foregoing reasons, reconsideration and allowance of claims 1-14 as amended is respectfully requested. Please telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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